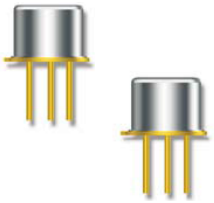
2N2218, A, AL & 2N2219, A, AL

NPN Switching Silicon Transistor

Rev. V1

Features

- Available in JAN, JANTX, JANTXV and JANS per MIL-PRF-19500/251
- TO-5 & TO-39 (TO-205AD) Package



Electrical Characteristics

Parameter	Test Conditions	Part #	Units	Min.	Max.
Off Characteristics:					
Collector - Emitter Breakdown Voltage	I_E = 10 mA	2N2218; 2N2219 2N2218A/AL; 2N2219A/AL	Vdc	30 50	—
Emitter - Base Cutoff Current	V_{EB} = 5 V V_{EB} = 6 V V_{EB} = 4 V	2N2218; 2N2219 2N2218A/AL; 2N2219A/AL All types	µAdc nAdc	— —	10 10 10
Collector - Emitter Cutoff Current	V_{CE} = 30 V V_{CE} = 50 V	2N2218; 2N2219 2N2218A/AL; 2N2219A/AL	nAdc	—	10
Collector - Base Cutoff Current	V_{CB} = 50 V V_{CB} = 60 V V_{CB} = 60 V V_{CB} = 75 V	2N2218; 2N2219 2N2218A/AL; 2N2219A/AL 2N2218; 2N2219 2N2218A/AL; 2N2219A/AL	nAdc nAdc µAdc µAdc	—	10 10 10 10
On Characteristics[1]:					
Forward Current Transfer Ratio	I_C = 0.1 mA, V_{CE} = 10 V	2N2218 2N2219 2N2218A/AL 2N2219A/AL	—	20 35 30 50	— — — —
	I_C = 1 mA, V_{CE} = 10 V	2N2218 2N2219 2N2218A/AL 2N2219A/AL		25 50 35 75	150 325 150 325
	I_C = 10 mA, V_{CE} = 10 V	2N2218 2N2219 2N2218A/AL 2N2219A/AL		35 75 40 100	— — — —
	I_C = 150 mA, V_{CE} = 10 V	2N2218/A/AL 2N2219/A/AL		40 100	120 300
	I_C = 500 mA, V_{CE} = 10 V	2N2218/A/AL 2N2219/A/AL		20 30	— —
Collector - Emitter Saturation Voltage	I_C = 150 mA, I_B = 15 mA	2N2218; 2N2219 2N2218A/AL; 2N2219A/AL	Vdc	— —	0.4 0.3
	I_C = 500 mA, I_B = 50 mA	2N2218; 2N2219 2N2218A/AL; 2N2219A/AL		— —	1.6 1.0

1. Pulse Test: Pulse Width = 300 µs, Duty Cycle ≤ 2.0%.

Electrical Specifications @ T_A = 25°C

Parameter	Test Conditions	Part #	Units	Min.	Max.
On Characteristics[1]:					
Base - Emitter Saturation Voltage	I_C = 150 mA, I_B = 15 mA	2N2218; 2N2219 2N2218A/AL; 2N2219A/AL	Vdc	0.6 0.6	1.3 1.2
	I_C = 500 mA, I_B = 50 mA	2N2218; 2N2219 2N2218A/AL; 2N2219A/AL		— —	2.6 2.0
Dynamic Characteristics:					
Small-Signal Short-Circuit, Forward Current Transfer Ratio	I_C = 1 mA, V_{CE} = 20 V, 1 kHz	2N2218 2N2219 2N2218A, AL 2N2219A, AL		25 50 35 75	—
Magnitude of Small-Signal Short-Circuit, Forward Current Transfer Ratio	I_C = 20 mA, V_{CE} = 20 V, 100 MHz	—		2.5	12
Output Capacitance	V_{CB} = 10 V, I_E = 0, 100 kHz ≤ f ≤ 1 MHz	—	pF	—	8
Input Capacitance	V_{EB} = 0.5 V, I_C = 0, 100 kHz ≤ f ≤ 1 MHz	—	pF	—	25
Switching Characteristics[2]:					
Turn-On Time	V_{CC} = 30 V, I_C = 150 mA, I_{B1} = 15 mA	2N2218, 2N2219 2N2218A, AL, 2N2219A, AL	ns	—	40 35
Turn-Off Time	V_{CC} = 30 V, I_C = 150 mA, I_{B1} = 15 mA	2N2218, 2N2219 2N2218A, AL, 2N2219A, AL	ns	—	250 300

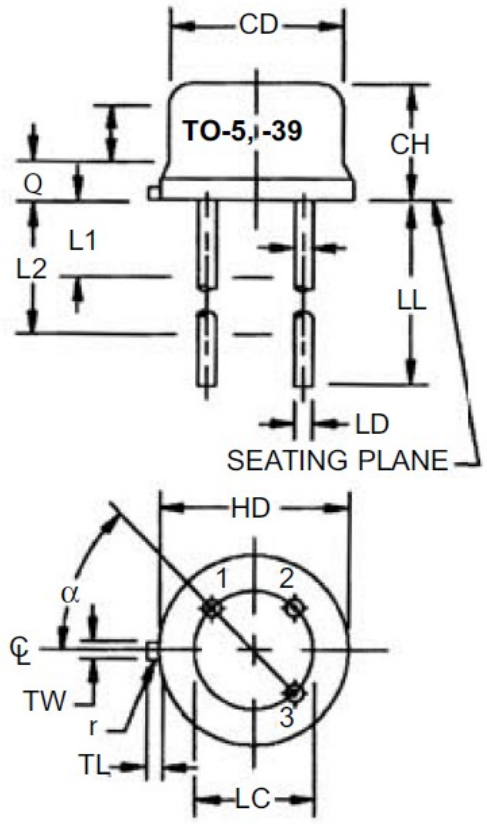
2. For Turn-On time see figure 3, and for Turn-Off time see figure 4 of MIL-PRF-19500/251.

Absolute Maximum Ratings @ T_C = 25°C

Parameter	2N2218 & 2N2219	2N2218A; AL & 2N2219A; AL
Collector - Emitter Voltage	30 Vdc	50 Vdc
Collector - Base Voltage	60 Vdc	75 Vdc
Emitter - Base Voltage	5 Vdc	6 Vdc
Collector Current	800 mA	
Total Power Dissipation[3,4] T_A = +25ºC T_C = +25ºC	 0.8 W 3.0 W	
Thermal Resistance, Junction to Case	50ºC/W	
Operating & Storage Temperature	-55°C to +200°C	

3. Derate linearly 4.6 mW/°C above T_A > +25°C.
4. Derate linearly 17.0 mW/°C above T_C > +25°C.

Outline Drawing (TO-5 & TO-39)



LTR	Dimensions				Note
	Inches		Millimeters		
	Min.	Max.	Min.	Max.	
CD	0.305	0.335	7.75	8.51	—
CH	0.240	0.260	6.10	6.60	—
HD	0.335	0.370	8.51	9.40	—
LC	0.200 TP		5.08 TP		7
LD	0.016	0.019	0.41	0.48	8, 9
LL	See note 14				
LU	0.016	0.019	0.41	0.48	8, 9
L1	—	0.050		1.27	8, 9
L2	0.250	—	6.35	—	8, 9
P	0.100	—	2.54	—	7
Q	—	0.030	—	0.76	5
TL	0.029	0.045	0.74	1.14	3, 4
TW	0.028	0.034	0.71	0.86	3
r	—	0.010	—	0.25	10
α	45° TP		45° TP		7

1. Dimensions are in inches.
2. Millimeters are given for general information only.
3. Beyond r (radius) maximum, TW shall be held for a minimum length of .011 (0.28 mm).
4. Dimension TL measured from maximum HD.
5. Body contour optional within zone defined by HD, CD, and Q.
6. CD shall not vary more than 0.010 inch (0.25 mm) in zone P. This zone is controlled for automatic handling.
7. Leads at gauge plane 0.054 +0.001 –0.000 inch (1.37 +0.03 -0.00 mm) below seating plane shall be within 0.007 inch (0.18 mm) radius of true position (TP) at maximum material condition (MMC) relative to tab at MMC. The device may be measured by direct methods or by gauging procedure.
8. Dimension LU applies between L, and L,. Dimension LD applies between L, and LL minimum. Diameter is uncontrolled in and beyond LL minimum.
9. All three leads.
10. The collector shall be internally connected to the case.
11. Dimension r (radius) applies to both inside corners of tab.
12. In accordance with ASME Y14.5M, diameters are equivalent to Φx symbology.
13. Lead 1 = emitter, lead 2 = base, lead 3 = collector.
14. For non-S-suffix devices (T0-5), dimension LL = 1.5 inches (38.10 mm) min. and 1.75 inches (44.45 mm) max. For S-suffix types (T0-39), dimension LL = 0.5 inch (12.70 mm) min. and 750 inch (19.05 mm) max.